

APPENDIX

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Object-oriented programming: Abbreviated OOP.

A programming paradigm in which a program is viewed as a collection of discrete objects that are self-contained collections of data structures and routines that interact with other objects. A class defines the data structures and routines of an object. An object is an instance of a class that can be used as a variable in a program. In some object-oriented languages, objects respond to messages, which are the principal means of communication. Other object-oriented languages retain the traditional procedure-call mechanism. See also C++, object, Objective-C.

Object-oriented programming. A style of programming that uses objects to represent data and behavior. An object is a data structure that can contain data and routines that operate on the data. Objects are created and manipulated by sending messages to them. See also C++, object, Objective-C.

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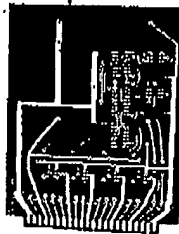
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circuit analyzer

interconnected to perform a particular task. At one level, a computer consists of a single circuit; at another, it consists of hundreds of inter-connected circuits.

Circuit analyzer Any device for measuring one or more characteristics of an electrical circuit. Volts, current, and resistance are the three variables most commonly measured. Oscilloscopes and multimeters are circuit analyzers.

Circuit board A flat piece of insulating material such as epoxy or phenolic resin, on which electrical components are mounted and interconnected to form a circuit. See the illustration. Most modern circuit boards use patterns of copper foil to interconnect the components. The foil layers may be on one or both sides of the board and in some advanced designs, in several layers within the board. A printed circuit board is one in which the pattern of copper foil is laid down by a printing process such as photolithography. See also printed circuit board.



Circuit board

Circuit breaker A switch that opens and cuts off the flow of current when the current exceeds a certain level. Circuit breakers are placed at critical points in circuits to protect against damage that could result from excessive current flow, which is typically caused by component failure. Circuit breakers are often used in place of fuses because they need only to be reset rather than replaced. Compare fuses.

Circuit card See circuit board.

Circuit switching A method of sending commu-

clean room

nications lines, as through the telephone system, by creating a physical link between the transmitting and receiving parties. In circuit switching, the connection is made at a switching center, which physically connects the two parties and maintains an open line between them for as long as needed. Circuit switching is typically used in modern communications on the desktop telephone network, and is also used on a smaller scale in privately owned, noncommercial networks.

Compare message switching, packet switching, which processing continues, as in a ring, through all items and returns to the starting point, no matter where that point is located in the ring. See also linked list.

CISC Pronounced "sisk," abbreviation for complex instruction set computing. A phrase describing a processor that uses complex instructions at the assembly language level. The instructions can be very powerful, allowing for compact and flexible ways of rebuilding such elements as memory addresses. All this complexity usually requires many clock cycles to execute each instruction. Compare RISC.

Class In object-oriented programming, a general term for a group of related objects, called objects, that can exist within it. A class is a descriptive tool used in a program to define a set of attributes or a set of services (operations available to other parts of the program) that characterize any member (object) of the class. Program classes are comparable in concept to the types of personalities people use, often subconsciously, to organize information—one familiar example being the categories animal, vegetable, and mineral, which define the physical world. Like program classes, such categories define the types of objects they contain and the ways those objects behave. The definition of classes in object-oriented programming is comparable to the definition of types in languages such as C and Pascal. See also object-oriented programming.

Clean room A room in which dust and other small particles are filtered from the air and in which protective clothing is worn to avoid con-

translation program

is to feed another program, either on a storage medium or in memory. An installation program might be used to guide a user through the often complex process of setting up an application for a particular combination of machine, printer, and monitor. Installation programs are also used when an application is copy-protected and cannot be copied by normal operating-system commands. Such installation programs typically limit the number of copies that can be installed to move a copy that has been installed on one machine to another machine; the user must deactivate a copy and re-install it on the other machine (often with the same installation program).

Translator A program provided by Apple with each new release of the Macintosh operating system. The translator allows the user to install system upgrades and to make bootable (operating) disks. In object-oriented programming, an object is called *myObject* (where *myObject* is a variable name) and then creates (allocates memory for) a *myObject* object. See also class, instance variable, instance object.

Instance variable In object-oriented programming, a variable associated with an object, which is an instance of a class. If a class defines a certain variable, then each instance of that class has its own copy of that variable. See also class, instance object, object-oriented programming.

Instance object In object-oriented programming, an instance of a class. See also class, instance object.

Instruction An action statement in any computer language, machine, assembly, high-level, algorithm, or other form used with reference to some hardware device. Most programs can be broken down into two types of statements: instructions and declarations. See also declaration, statement.

Instruction code See operation code.

Instruction counter See instruction register.

Instruction cycle The process in which a microprocessor retrieves an instruction from memory, decodes it, and carries it out. An instruction cycle

translator

consists of two parts, the instruction (fetch) time and the execution (execute and execute) time. An instruction cycle is measured by the number of clock ticks (pulses of a computer's internal timer) that a particular instruction consumes. Instructions take the amount of time of instructions contained in a program, such as assignment instructions, mathematical (floating-point or integer) instructions, control instructions, instructions of control programs (CPLs) because it tells them which instructions should be shortened to yield the greatest speed. Finally, knowledge of instruction times is useful to people designing benchmarks because it enables the designers to make benchmarks relevant to real tasks.

Instruction pointer See program counter.

Instruction register A register (a small, high-speed memory circuit) that holds the address of the next instruction to be executed.

Instruction set The set of machine instructions that a microprocessor recognizes and can execute. An instruction set includes hardware, register, and data instructions, such as add, subtract, multiply, and divide. Each microprocessor has its own instruction set. In some instances, an instruction set is defined more broadly to include instructions in programming languages as well. See also assembly language.

Instruction time See instruction cycle.

Instruction word The length of a machine language instruction, or the instruction itself, which typically consists of a code identifying the type of instruction, one or two operands (which might be registers, memory locations, or constants), and possibly other data. See also operand, machine code.

Interrupt Often called *nonsequencer*. Any disturbance that is a very poor conductor of electricity.

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